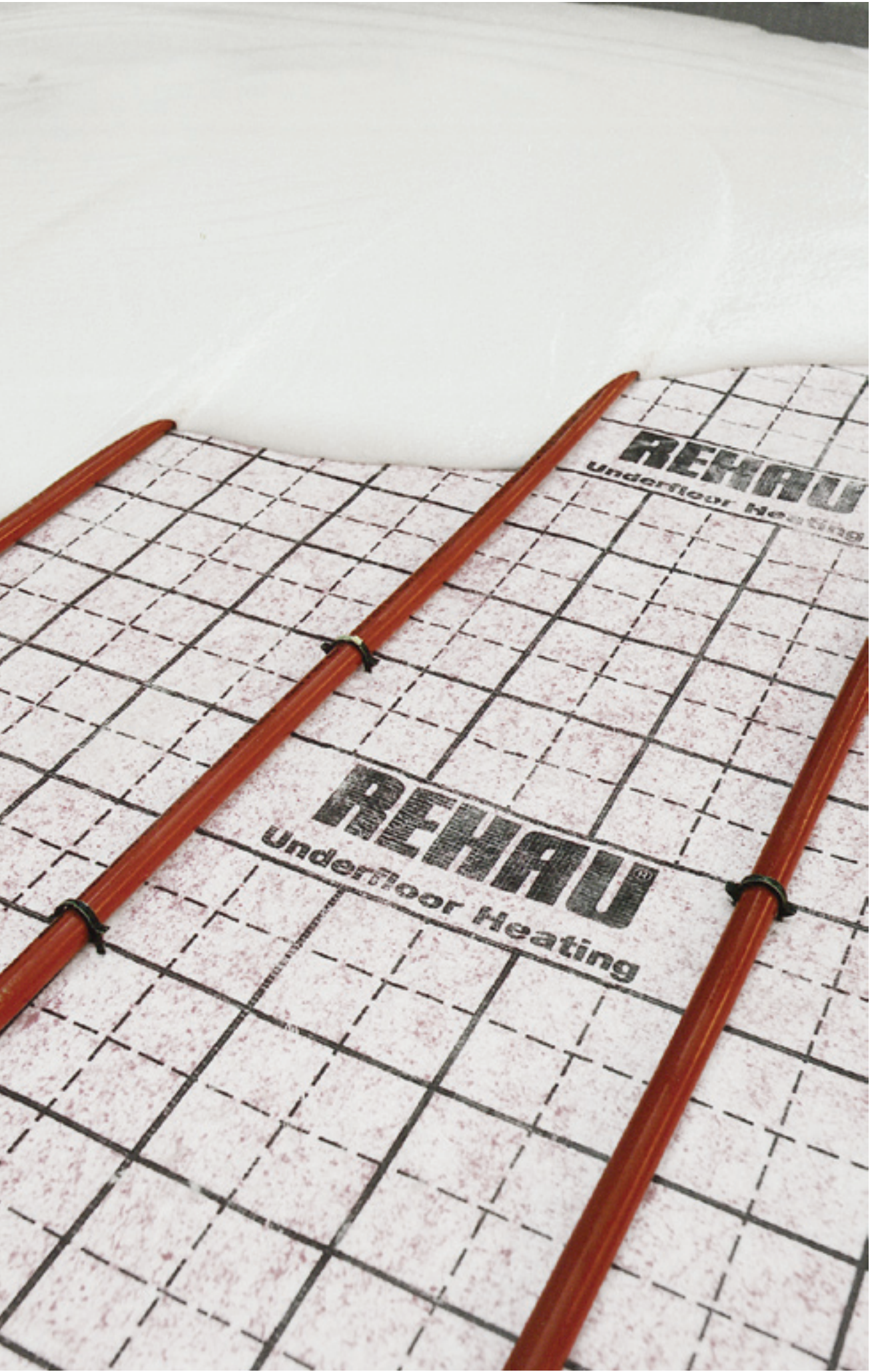


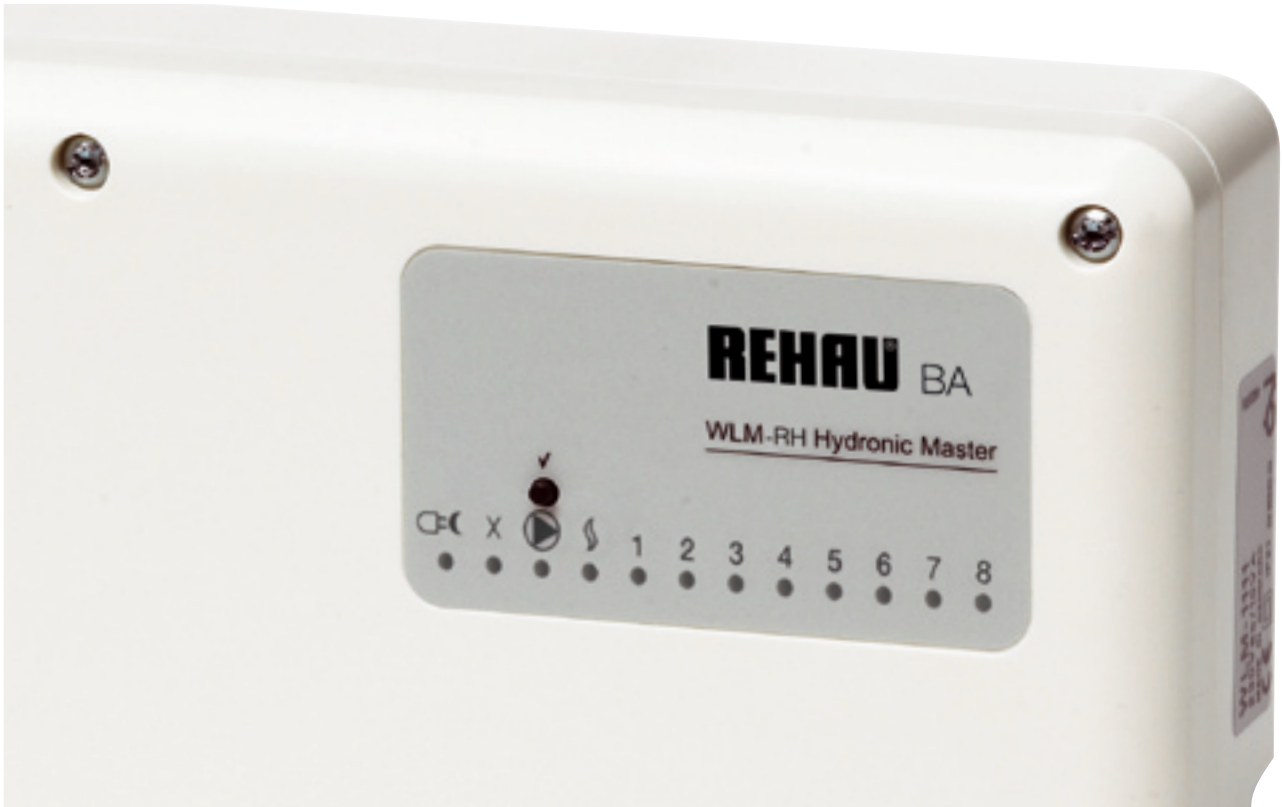


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## BA MASTER CONTROLLER

### QUICK INSTALLATION AND COMMISSIONING GUIDE

# BA MASTER CONTROLLER

## INDEX

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All REHAU control systems must be installed:

- By a competent person
- In accordance with the latest issue of instructions supplied with each component
- According to the current IEE wiring regulations laid out in BS 7671 and National Valid regulations and in compliance with the ordinaries stipulated by local power authorities.



Please note this is a quick Installation and Commissioning guide only, for any detailed information, please refer to REHAU Intelligent BA Heating/Cooling Controls, Technical and Installation Manual.

# 1.0 CONTROL SYSTEM FIRST FIX

Please note this system only requires Bell wire or Cat 5 cable for wiring of controls, saving time and money.

## 1.1 Cable Sizes

|                                                                                                 |                                                     |                                      |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------|
| Planned position of main heating switch fuse spur to main control unit                          | 1mm <sup>2</sup> two core & earth                   | Detail B on wiring schematic (Mains) |
| Control unit to FH circulating pump.<br>Or to the connector block if using a compact mixer unit | 1mm <sup>2</sup> two core & earth                   | Please refer to wiring schematic     |
| Wiring to main system boiler controls                                                           | 1mm <sup>2</sup> two core & earth                   | Detail B on wiring schematic         |
| Room Sensor wiring (serial or star)***                                                          | 0.25mm <sup>2</sup> two core, no earth              | Please refer to wiring schematic     |
| Control unit to actuator (if more than 1m away)                                                 | 1mm <sup>2</sup> two core, no earth, max length 40m | Detail C on wiring schematic         |

\*\*\* It is recommended that different coloured cables are used for the 5v bus connection of the sensors and the BA Master Controller. Care must be taken to ensure correct wiring connection between Sensors & Controller terminals. If wires of the same colour are used it is very likely to get the polarity wrong.

## 1.2 Connecting Sensors

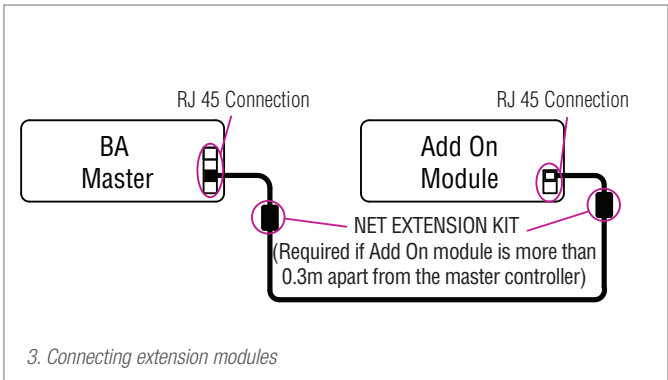
This system does not require star wiring, Daisy Chain is only required. This would reduce installation time and costs.

## 1.3 Net Extension Kit

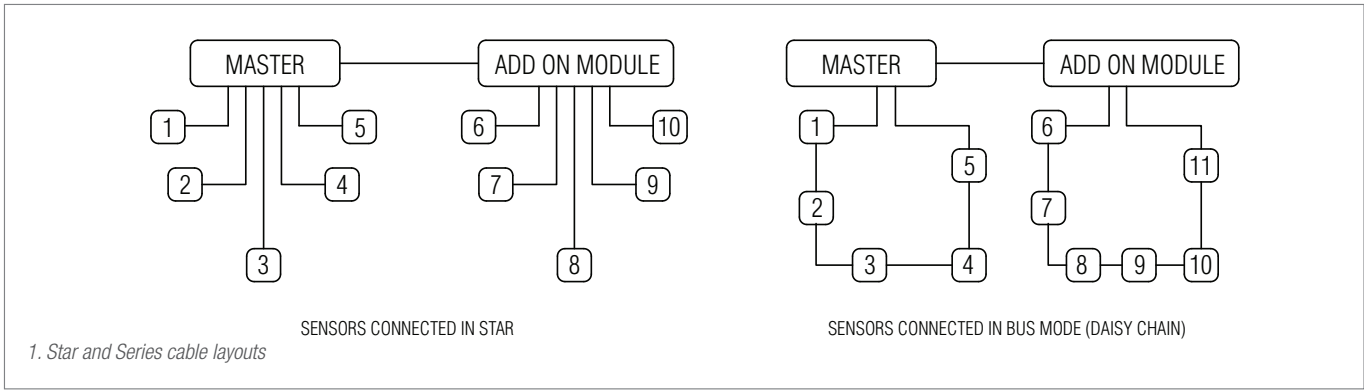


2. Net extension kit

|                                                                               |                                                                                                |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Planned Main Control Unit position to Add On Module (if more than 0.3m apart) | 1 Net Extension Kit REHAU Art. No. 202239                                                      |
| When networking multiple controllers a Net Extension Kit is required          | e.g. Networking 3 Master Controllers (BA) requires 2 Net Extensions Kits REHAU Art. No. 202239 |

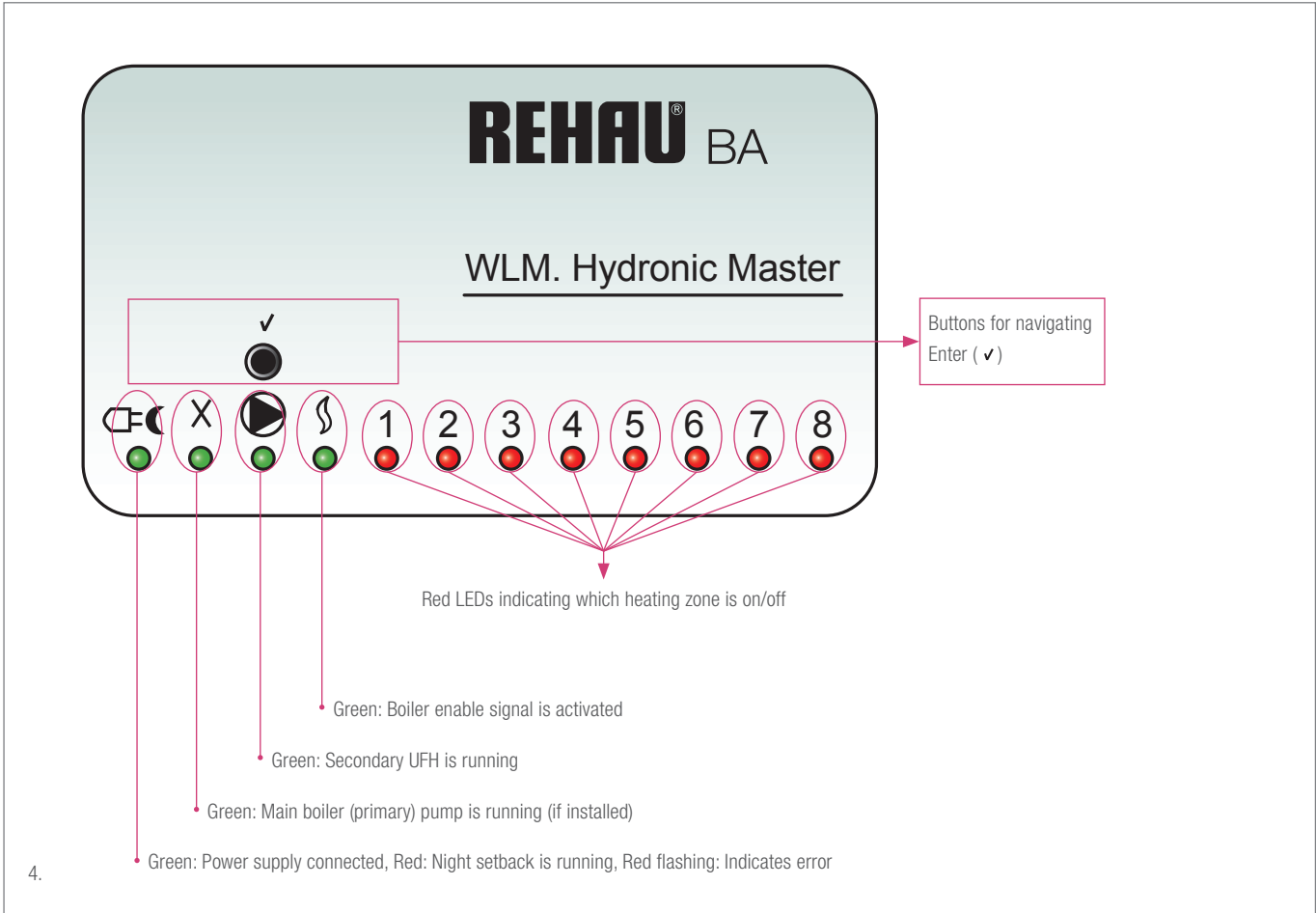


3. Connecting extension modules



1. Star and Series cable layouts

2.0 QUICK COMMISSIONING GUIDE



2.1 Determining the Master Controller required

A zone is an area where a set sensor is required e.g. bedroom 1 zone, bathroom 1 zone, etc. The table below describes the required controller depending on the number of zones:

| Number of zones | BA Master Controller | Add On Modules |
|-----------------|----------------------|----------------|
| Up to 8 zones   | 1                    | 0              |
| 9 to 14 zones   | 1                    | 1              |

2.2 The default (factory) settings on the BA Master Controller shown below

| Description                        | Symbol | Factory settings |
|------------------------------------|--------|------------------|
| Day temperature                    | ☀      | 21°C             |
| Night temperature                  | ☾      | 18°C             |
| Off temperature (Frost protection) | ❄      | 5°C              |
| Floor Limit temperature, high      | ↓🔥     | 27°C             |
| Floor Limit temperature, low       | ↓❄     | 17°C             |

The above set values cannot be altered in the BA Master Controller.



BA Master Controller controls only temperature settings, there is no time control. If a REHAU CT2 Programmable Room Sensor is NOT fitted on the system, an external time clock (Detail D of the Wiring Schematic with external switch wiring) will be required to control the time switching of the system.

2.3 Setting the channels on the sensors

This is important because without setting the right channel/zone number on the sensor, heating in the related zone would not work. To carry this out please follow the procedure below.

2.3.1 Remove the top plate of the sensor (Fig. 5.1)

2.3.2 A clock shaped dial can be identified on the right hand side

Each sensor on the system is to be allocated with a channel number by the commissioning engineer.

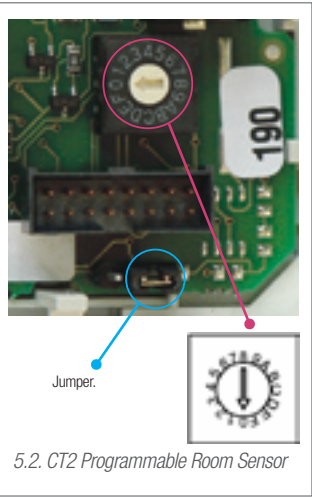
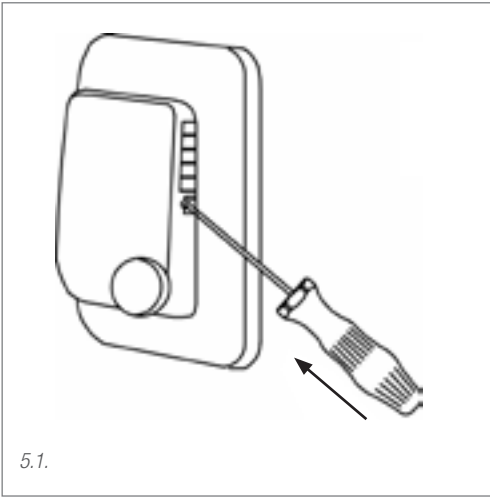
The number of its output (its channel number) can be set with a screwdriver as shown in Fig 5.2. The channel selection on all sensors can be carried out without the sensor being supplied with power.

Sensor set to Channel 1 will activate the thermal actuators connected to output TH1 within the controller. This will control the actuators connected to that zone. For channel numbers 10 to 14, use the letter designation A to E. 10 = A, 11 = B, 12 = C etc.

As shown in Fig 5.2; each CT2 Programmable Room Sensor comes fitted with a jumper parked on one pin (shown within a light blue circle). If a floor sensor is used on the CT2 Programmable Room Sensor ensure that the jumper is parked on two pins.



Note: If the jumper is parked on two pins and no floor sensor is used, an error light will flash on the controller LED.



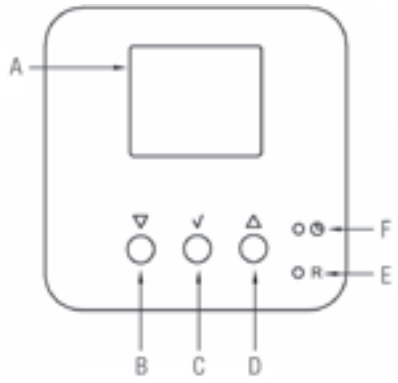
2.5

CT SET UP GUIDE

PROGRAMMABLE ROOM SENSOR, DOMESTIC HOT WATER,  
RADIATOR AND TWO STAGE CONTROLLER

CT2 —————> Programmable Room Sensor, CT2 / R —————> Radiator Controller, CT2 / HW —> Domestic Hot Water Controller  
CT2 / 2 —————> Two Stage Controller

This user guide applies for all the controllers mentioned above,  
with certain instructions only for specific controllers.

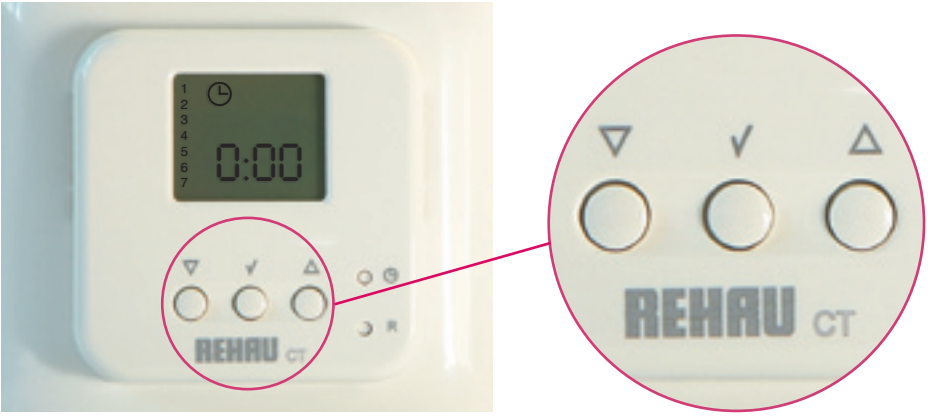


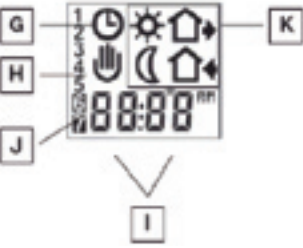
|           |                 |             |
|-----------|-----------------|-------------|
| <b>A:</b> | <b>B:</b> ▼     | <b>C:</b> ✓ |
| Display   | Adjustment down | OK - accept |

|               |                          |                            |
|---------------|--------------------------|----------------------------|
| <b>D:</b> ▲   | <b>E:</b> R              | <b>F:</b> ⌚                |
| Adjustment up | Reset to factory setting | Pin button adjust of clock |

5.3. REHAU CT2 Programmable Room Sensor/Controller showing front cover layout

The REHAU CT2 Programmable Room Sensor Controller has 3 main buttons to navigate: UP ▲, DOWN ▼ and ENTER ✓ (circled).





|                |             |                      |
|----------------|-------------|----------------------|
| <b>G:</b>      | <b>H:</b>   | <b>I:</b>            |
| Automatic mode | Manual mode | Time and Temperature |
| ⌚              | ☀️          | 88:88 AM             |

|               |                                           |
|---------------|-------------------------------------------|
| <b>J:</b>     | <b>K:</b>                                 |
| Day Number    | 4-event symbol                            |
| 1 2 3 4 5 6 7 | ☀️ Wake      🏠 Out<br>🌙 Night      🏠 Home |

5.4. REHAU CT2 Programmable Room Sensor/Controller



1. The time will have to be set as soon as the CT2 Programmable Room Sensor is switched on for the first time, the hour digits start to flash.



1.1a To change the hours on the clock, use the ▲ and ▼ to select the correct hour (24 hour clock is default) and then press ✓ .



1.1b Then the minutes will start to flash, adjust as above and press ✓ to confirm.



1.2 The day of the week then has to be set.  
Number 1 on the top left of the screen will flash, select the correct day by using the up and down arrows. 1 is Monday, 2 is Tuesday....6 is Saturday, 7 is Sunday. Press ✓ to confirm.



1.3 This shows the channel numbers for the following zones:-  
  
To set which channels the CT2 Programmable Room Sensor controls, press ✓ to select the first zone



CH 1.  
1.4 Use the UP and DOWN arrows to either select ON.



1.5 or OFF.  
Press ✓ to confirm, then the next channel will appear.



1.6 Repeat for each channel as desired.

To leave this menu, either go through all 14 channels and press ESC (below) or don't press any buttons for 10 seconds and it will revert to main screen.



1.7 To quit a sub-menu at any time, navigate the menus until you reach ESC and press ✓ .

N.B. Steps 1 - 3 are a requirement to enable the correct operation of the control system.  
Steps 4 - 8 are optional.



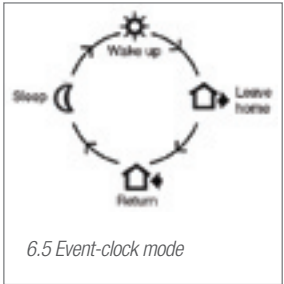
1.8 The date and time are now set.

N.B. Time has to be manually changed between BST and GMT.

To change the default time settings.

2. The default time events are shown below, if you do not wish to change them, proceed to step 3.

If you do wish to change them, follow step 2.



| DAY 1-5 | TIME  | TEMPERATURE |            |
|---------|-------|-------------|------------|
| Day     | 06:00 | 21°C        | 50°C (DHW) |
| Out     | 08:00 | 15°C        | 30°C (DHW) |
| In      | 16:00 | 22°C        | 50°C (DHW) |
| Night   | 22:30 | 18°C        | 30°C (DHW) |

| DAY 6-7                | TIME    | TEMPERATURE                              |            |
|------------------------|---------|------------------------------------------|------------|
| Day                    | 08:00   | 22°C                                     | 50°C (DHW) |
| Night                  | 23:00   | 15°C                                     | 30°C (DHW) |
| 4 Event Sequence       | 4.5.2   |                                          |            |
| High limit temperature |         | 29°C (CT2 Programmable Room Sensor only) |            |
| Low limit temperature  |         | 17°C (CT2 Programmable Room Sensor only) |            |
| Scale                  | 24hr/°C |                                          |            |

N.B. All event times must be in the same 24hr period.

REHAU recommend a 2 hour warm up / cool down time for your underfloor heating, e.g. to be warm at 7am, start the first event, DAY, at 5am.

|                                                |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>4-event clock mode/<br/>automatic mode:</b> |  | In automatic mode, the clock function symbol (☀️🌙) and one of the 4-event symbols (🏠🚗🏠🚗) will be indicated.                                                                                                                                                                                                                                                                                                                                    |
| <b>Comfort mode:</b><br>5 secs.                |  | <b>Temporary override</b><br>To temporarily override any temperature in the 4-event schedule program, press the UP (▲) button once, to show the temperature in the display, and press UP (▲) or DOWN (▼) again to increase or decrease the temperature. The display will flash for 5 seconds, and will then revert to the time. The override will operate until the next programmed event when the sensor will resume the automatic programme. |
| ✓ ✓                                            |  | <b>Cancel comfort mode</b><br>To cancel the temporary override, press the OK (✓) button twice.                                                                                                                                                                                                                                                                                                                                                 |
| <b>Manual mode:</b><br>5 secs.                 |  | <b>Permanent override</b><br>During holidays, the scheduled 4-event program can be overridden. Press the OK (✓) button, and then the UP (▲) or DOWN (▼) button until the override temperature is set. The set temperature will remain in the display and the unit will now operate to this temperature permanently.                                                                                                                            |
| ✓                                              |  | <b>Cancel comfort mode</b><br>To cancel the permanent override state press the OK (✓) button once, and the unit will resume automatic function.                                                                                                                                                                                                                                                                                                |



2.1a Hold the ✓ button for 3 seconds.  
This screen will be displayed. This shows the start time of the first event, DAY, which is the first time the heating comes on.  
If this is to be changed, use the UP and DOWN arrows like when setting the time.

If it is not to be changed, press ✓ twice to move on.



2.1b This is the temperature for the DAY event.  
Adjust if required as above. If not press ✓ to continue.

N.B. If no buttons are pressed for a while, the CT2 Programmable Sensor/Controller will revert back to the main screen and you will have to start again.



2.2a The time the second event starts - OUT.  
Adjust if required as above. If not press ✓ twice to continue.



2.2b This is the temperature of second event - OUT.  
Adjust if required as above. If not press ✓ to continue.



2.3a The time the third event starts - IN.  
Adjust if required as above. If not press ✓ twice to continue.



2.4b The temperature for the third event - IN.  
Adjust if required as above. If not, press ✓ to continue.



2.5a The time for fourth event to start - NIGHT.  
Adjust if required as above. If not press ✓ twice to continue.



2.5b The temperature for fourth event - NIGHT.  
Adjust if required as above. If not, press ✓ to continue.



2.6a Days 6 and 7 (Saturday and Sunday) only have 2 events - DAY and NIGHT.  
This screen shows the start time of day event.

Adjust if required as above. If not press ✓ twice to continue.



2.6b The temperature for DAY event at weekend.  
Adjust if required as above. If not, press ✓ to continue.



2.7a The time which the NIGHT event starts at weekend.  
Adjust if required as above. If not press ✓ twice to continue.



2.7b The temperature for the NIGHT event.  
Adjust if required as above. If not, press ✓ to continue.



2.8 Once the settings are completed, the CT2 Programmable Room Sensor/Controller returns to the standard screen, showing time, day and current event.



3. **Temporary Override (to change current temperature temporarily)**

Press the UP button once, the temperature then flashes.  
Adjust to desired temperature with UP and DOWN buttons. The display then flashes for 5 seconds and then reverts back to main screen.  
To cancel, press ✓ twice.



3.1 **Permanent Override (e.g. occupants go on holiday)**

Press ✓ on main screen.  
Use UP and DOWN buttons until desired temperature reached. Press ✓ to confirm.  
The display will remain on the override temperature until it is cancelled.  
To cancel, press ✓ once.



4 **Changing event sequence over different days (if required)**

Hold UP and DOWN buttons to reach sub-menus.  
Scroll through and press ✓ on Pro.  
The 5 possible sequences below can be scrolled through and selected by ✓.



4.1a 4 events on 5 days, 2 events on 2 days (default).



4.1b 4 events on 6 days, 2 events on 1 day.



4.1c 4 events for 7 days.



4.1d 2 events for 7 days.



4.1e 2 events for 5 days, 1 event for 2 days.



5 **Setting Floor Sensors (only available on CT2 Programmable Room Sensor)**

Hold UP and DOWN buttons to reach sub-menus.  
Scroll through and press on ✓ on HiLi.



5.1 Adjust maximum floor sensor temperature with UP and DOWN buttons, press ✓ to confirm.

N.B. Only a maximum OR minimum floor sensor can be fitted to each CT2 Programmable Room Sensor, not both.



5.2 Select LoLi if minimum floor sensor fitted.



5.3 Adjust minimum floor sensor temperature as above.



6. To See Current Sensor Info

Hold UP and DOWN buttons to reach sub-menus.  
Scroll through and press ✓ on InFo.



6.1 The first screen shows the software version.



6.2 Press DOWN to show current room temperature.  
Press DOWN again to show floor temperature (if floor sensor fitted).  
Press ✓ to return to main screen.

N.B. No values can be changed in InFo.



7 Changing the Scale from °C to °F and 12-24hr

Hold UP and DOWN buttons to reach sub-menus.  
Scroll through and press ✓ on SCAL.  
This allows you to change the clock and the temperature units.



7.1 Press UP and DOWN to scroll through options and ✓ to select desired scale.

The first is 24 hour clock and temperature in celsius.



7.2 24 hour clock and temperature in fahrenheit.



7.3 12 hour clock and temperature in celsius.



7.4 12 hour clock and temperature in fahrenheit.



8.0 Turning on Adaptive function ensures that the room will reach the correct temperature at the desired time.

Hold UP and DOWN buttons to reach sub-menus.  
Scroll through and press ✓ on ADAP.



8.1a Use the UP and DOWN arrows to either select ON.



8.1b or OFF.  
Press ✓ to confirm, then the next channel will appear.



Below only required for CT2 / 2 Controller (Two Stage Controller)



9. To change advanced settings on the two stage controller

Advanced settings on two stage controller. Using these settings, the secondary heat source could be turned on if the room does not reach the correct temperature in the desired time. An example would be to bring the second stage if temperature has not reached 2°C of the set point within 30 minutes

Hold UP and DOWN buttons to reach sub-menus.  
Scroll through and press ✓ on 2 ST



9.2a Use the UP and DOWN arrows to either select ON.



9.2b or OFF.  
Press ✓ to confirm, then the next channel will appear.



9.3 'LEAP' will start to flash on the screen, press ✓ to confirm.



9.4 Use the UP and DOWN arrows to set the temperature between 0 to 10°C, press ✓ to confirm.

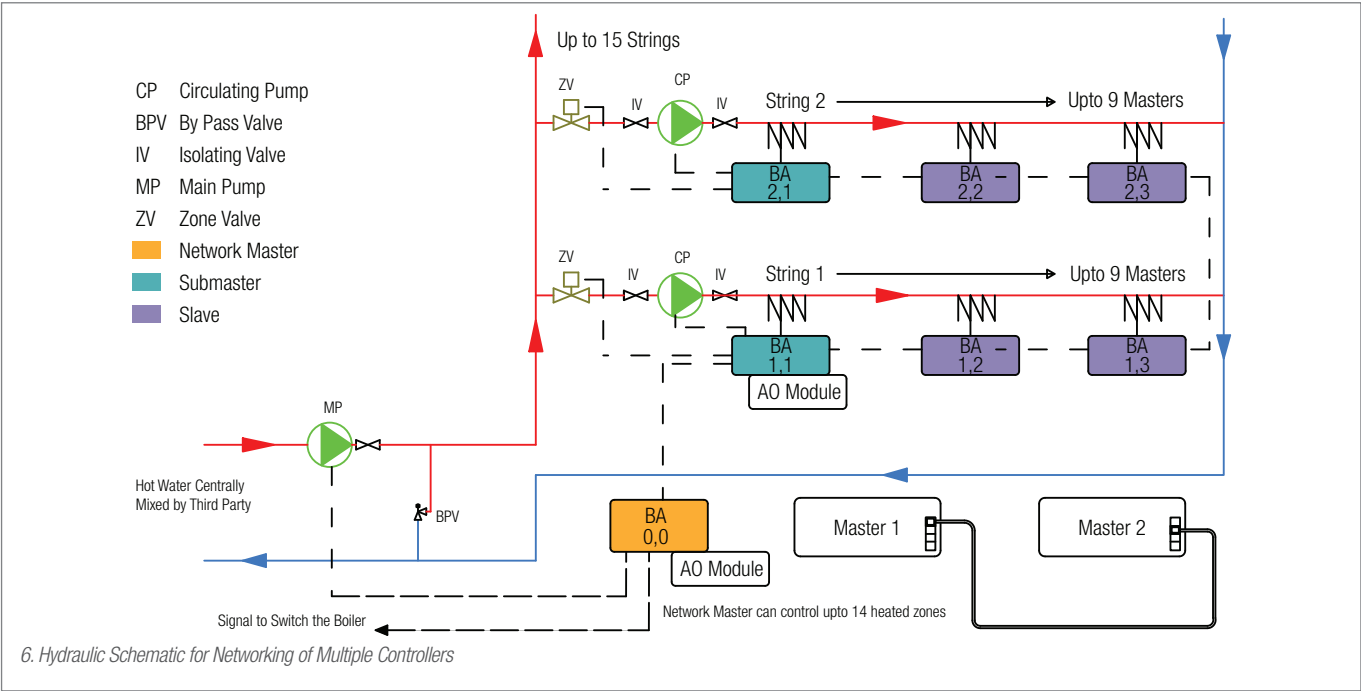


9.5 'EINE' will start to flash on the screen, press ✓ to accept.



9.6 Use the UP and DOWN arrows to set the time between 0 to 2hrs, press ✓ to confirm.

### 3.0 NETWORKING MULTIPLE CONTROLLERS

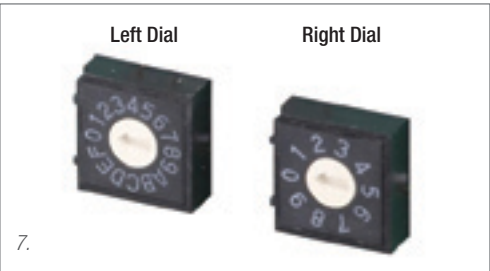


In larger buildings with more than 14 zones where multiple manifolds are utilised, it is possible to use multiple masters to create a single network. One master must be defined as the “network controlling master” by setting both dials to zero (see table below).

Using more than one secondary pump

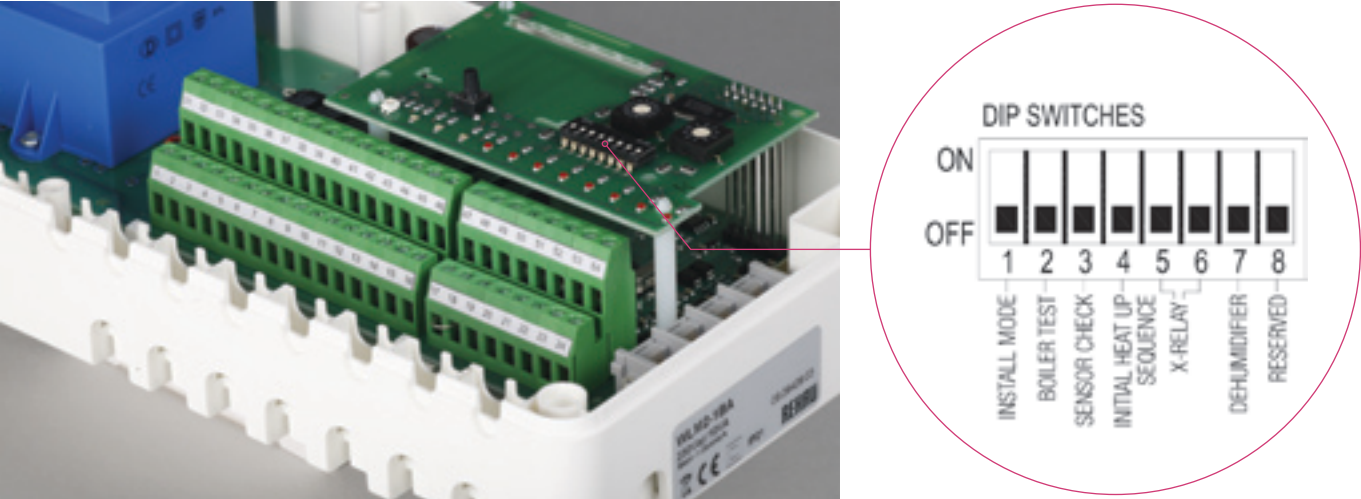
1. If more than one secondary pump is used, a separate string should be created for each pump (see Fig. 6). On the first string all left hand dials in the slaves must be set to 1, and the right hand dial should be set in sequence from 1 to 9. On the second string of masters/slaves all left hand dials should be set to 2 and the right hand dials again should be set in sequence from 1 to 9. This numbering can be continued for up to 15 strings.
2. All main controllers are interconnected using special cable via the RJ 45 socket 1 or 2.
3. RJ 45 connection of string 1 to string 2 etc., can be achieved via string 1 slave to string 2 submaster or string 1 slave to string 2 slave as shown in Fig.6.
4. An BA Master Controller can be used as the “network controlling master” for central mixing control of supply water and boiler switching.

| Master and Slave           | Left dial set to | Right dial set to |
|----------------------------|------------------|-------------------|
| Network Controlling Master | 0                | 0                 |
| String 1 Submaster         | 1                | 1                 |
| String 1 Slave             | 1                | 2 to 9            |
| String 2 Submaster         | 2                | 1                 |
| String 2 Slave             | 2                | 2 to 9            |
| Up to String 15 Submaster  | 1 to F           | 1                 |



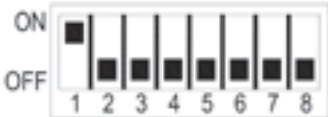
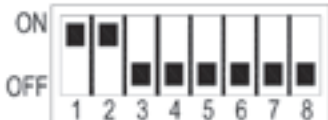
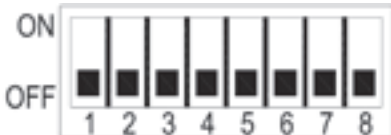
4.0 CHECKING CONTROL SYSTEM OPERATION

After setting the channels, it is possible to check the entire control system.



Area circled shows the DIP switches on the Master Controller

System check procedure

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Sensor check:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                  |
| a. Switch on DIP-3 to activate sensor check - power light starts blinking.<br>b. Each red channel light on the Master Controller should now be lit if a Room Sensor is present on that channel.<br>c. Switch off DIP-3 to de-activate sensor check - power light stops blinking.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  <p>DIP Switch 3 turned to 'ON' on the Master Controller to enable 'Sensor Check'</p>        |
| <b>2. Install mode:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                  |
| a. Turn all adjustable temperature settings on the Room Sensors to minimum.<br>b. Switch on DIP-1 on the Master Controller to activate install mode (Install mode will be active for 2 hours).<br>c. Turn the temperature setting on the adjustable Room Sensor in room 1 to maximum. The red channel 1 light should be lit and the actuator on output number 1 will be activated.<br>d. After 3 mins 10 secs UFH pump and mixing valve output will operate.<br>e. Repeat step 2c on all rooms.<br><b>Note 1:</b> Install mode will only be active for 2hrs, after this it returns to normal control if left on.<br><b>Note 2:</b> If the Room Sensor is of a wireless type, a delay of up to 5 minutes may occur before the channel light becomes illuminated.<br><b>Note 3:</b> If DIP-5 and DIP-6 are off this enables main pump after 10 secs. |  <p>DIP Switch 1 turned to 'ON' on the Master Controller to enable 'Install Mode'</p>        |
| <b>3. Boiler test:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                  |
| a. Switch on DIP-1 & 2. This closes the boiler start relay contacts for 1 minute.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  <p>DIP Switch 1 &amp; 2 turned to 'ON' on the Master Controller to enable 'Boiler Test'</p> |
| <b>4. To end all tests:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                  |
| a. Switch off DIP-1 to deactivate sensor check<br>b. Switch off DIP-2 to deactivate boiler test.<br>c. Set all Room Sensor dials to centre position i.e. zero.<br>d. Room Controllers recommended to 21°C.<br>e. Set all override switches to automatic position (clock symbol).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                              |
| <b>5. The system is now operating automatically.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                  |

5.0 ERROR/FAULT MESSAGES AND TROUBLESHOOTING

| Troubleshooting                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Problem                                                                                                      | Possible cause & Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Channel light is not coming on<br>(When in Sensor Check (DIP3) Mode)                                         | Make sure the power light is blinking. If not then put DIP-3 to ON position.<br><br>2-wire bus may be incorrectly connected. Voltage at each Room Sensor should not be lower than 4.0V (check for + & - continuity and short circuits).<br><br>For Wireless Room Sensors, please check that the batteries have been inserted correctly.<br><br>Have the Wireless Controllers/ Sensors been initialised<br><br>For Wireless Room Sensor check that the REHAU RC (receiver) is correctly connected.<br><br>For channel 9-14, is the Add On Module correctly connected to the Master Controller.<br><br>Make sure the Room Sensor in that room is set to the correct channel number.<br><br>The channel selector on the Room Sensor may be slightly out of position, try rotating and set it again. |
|                                                                                                              | (When in Install mode (DIP1), when the CT2 Programmable Room Sensor is activated (set to maximum))<br><br>Master is not in install mode - after 2 hours the master automatically de-activates install mode - please reset the DIP-1.<br><br>Make sure the Room Sensor in that room is set to the correct channel number (two Room Sensors could be crossed over).                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| The actuator on the manifold has not opened after 3 minutes.                                                 | Check the red channel light is illuminated.<br><br>The actuator for the room is not connected to the correct output on the Master Controller.<br><br>Bad electrical connection between actuator and terminals.<br><br>Actuator may be faulty or manually locked.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| UFH Pump not starting in install mode                                                                        | Bad electrical connection between pump and terminals.<br><br>Install mode is not activated.<br><br>Pump may be faulty.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Output relay for Main pump, Cooling, High limit valve or other attached device, not starting in install mode | Incorrect connection to device (output relay has volt free contacts, see BA Master Controller wiring diagram for correct connection).<br><br>Bad electrical connection between terminals and attached device.<br><br>Install mode is not activated.<br><br>Attached device may be faulty.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Boiler does not fire<br>(LED lit)                                                                            | Incorrect connection to device (output relay has volt free contacts, see BA Master Controller wiring diagram for correct connection).<br><br>Bad electrical connection between terminals and attached device.<br><br>Install mode is not activated.<br><br>Attached device may be faulty.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                              | (LED not lit)<br><br>Timing sequence delay is activated<br><br>BA Master Controller only - mixing valve not open above 20%.<br><br>No heat demand from Room Sensors.<br><br>Master Controller is in cooling mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

5.0

ERROR/FAULT MESSAGES AND TROUBLESHOOTING

| Problem                                                           | Possible cause & Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Mixing valve does not operate correctly<br>(When in install mode) | Incorrect connection, see master wiring diagram for correct connection.<br>Valve/actuator assembly is incorrect.<br>Actuator is faulty.<br>Check what happens if sensor and/or outdoor module is missing.                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| (Valve cycles between open and closed in normal operating mode)   | Valve may be oversized.<br>Supply Limit sensor may be subject to heat migration.<br>Upstream water temperature is excessively high. (these problems may be corrected by changing PI settings – please refer to the REHAU Intelligent BA Heating/Cooling Controls, Technical and Installation Manual)                                                                                                                                                                                                                                                                                                                                           |
|                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Room is too cold.<br>(After running for at least 48 hours)        | The Room Sensor is placed in a position that does not represent the general temperature in the room. E.g. mounted on external wall or near an extraneous heat source.<br>If the room is controlled by a CT2 Programmable Room Sensor, check that the time and temperatures are set correctly.<br>If the Room Sensor has got an override switch (TM or TD), the switch may be set in the “off” or “night” position.<br>For rooms with floor sensors, the maximum floor limit setting could be preventing the room reaching the desired temperature.<br>Insufficient heating capacity of the system.<br>Bad insulation creating large heat loss. |
| Room is too hot<br>(After running for at least 48 hours)          | This could be caused by draughts within the wall cavities.<br>The Room Sensor is placed in a position that does not represent the general temperature in the room.<br>If the room is controlled by a CT2 Programmable Room Sensor, check that the time and temperatures are set correctly.<br>If the Room Sensor has got an override switch (TM or TD), the switch may be set in the “day” position.<br>For rooms with floor sensors, the minimum floor limit setting could be increasing the room temperature above the desired setting.<br>Solar gain or extraneous heat source.                                                             |

During normal operation the green power LED will be ON when the Master Controller is energised. The red output Channel LED's (1 to 8 on the Master Controller, and 9 to 14 on the add-on module) will indicate if the channel output relay is **ON/OFF**.

An error / fault message is shown by flashing the green power LED or one of the 8 red output Channel LED's. From the number of flashes on any one LED, the problem can be diagnosed, and identified from the following:

The error number will be indicated by the number of flashes, with a pause of less than a 1/2 second between the flashes. The indication will be followed by a pause of 2 seconds, following which the sequence will be repeated.

Flashing Power LED (green)

| Flashes    | Description                                                                                                                                                                                                                                                                                                                                                                                                                            | Corrective action                                                                                                                                                                               |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Flash    | One or more Room Sensors, room controllers, WLH, WLAC that are set to channel 0 or channel 15 are no longer sending data to the Master Controller.<br> If the Room Sensor is of the WIRELESS type, the error/fault message could be an indication that the power has failed, and that the internal battery of the Room Sensor needs to be replaced. | The fault is corrected by replacing the Room Sensor. The Master Controller will need to be HARD RESET (see below).                                                                              |
| 2 Flashes  | One or more Room Sensors have been set to a channel number which does not exist in the system. For example, the message will occur if the units are set to channels 9-14 and the required Add On Module are not found in the system.                                                                                                                                                                                                   | The error is corrected by setting the channel number of the Room Sensor to a channel that does exist within the installed Master Controller/Add On Module.                                      |
| 3 Flashes  | Application sensor defect.                                                                                                                                                                                                                                                                                                                                                                                                             | The fault is corrected by changing the temperature sensor. If the sensor has been removed deliberately to change the operation of the system, follow the HARD RESET instruction below.          |
| 4 Flashes  | The Outdoor Compensation Module (OC) is defective.                                                                                                                                                                                                                                                                                                                                                                                     | The fault is corrected by changing the Outdoor Compensation Module. If the module has been removed deliberately to change the operation of the system, follow the HARD RESET instruction below. |
| 5 Flashes  | The external Supply limit sensor (type ETF-1899A) is defective.                                                                                                                                                                                                                                                                                                                                                                        | The fault is corrected by changing the temperature sensor. If the sensor has been removed deliberately to change the operation of the system, follow the HARD RESET instruction below.          |
| 6 Flashes  | Internal overheating.                                                                                                                                                                                                                                                                                                                                                                                                                  | The Master Controller has its own internal safety temperature protection system. The problem is corrected by improving the ventilation around the Master Controller module.                     |
| 7 Flashes  | Defective internal overheat sensor. The Master Controller will control as normal, however the protection against internal over heating is no longer active.                                                                                                                                                                                                                                                                            | The fault can only be corrected by replacing the Master Controller module.                                                                                                                      |
| 8 Flashes  | The communication to the Add On Module has been lost.                                                                                                                                                                                                                                                                                                                                                                                  | The fault is corrected by re-establishing the connection to the Add On Module or by changing the Add On Module if it is defective - or if it has been deliberately removed, with a HARD RESET.  |
| 9 Flashes  | Indicates total number of input units exceeded.                                                                                                                                                                                                                                                                                                                                                                                        | Please refer to factory or your local service engineer.                                                                                                                                         |
| 10 Flashes | No connection to wireless receiver REHAU RC.                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                 |
| 11 Flashes | Step 2 on 2-step controller REHAU CT2/2 is used by another Room Sensor/ Controller.                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                 |

Only one error/fault condition can be shown at a time. If more than one error occurs, they will be prioritised in the sequence of flashes.

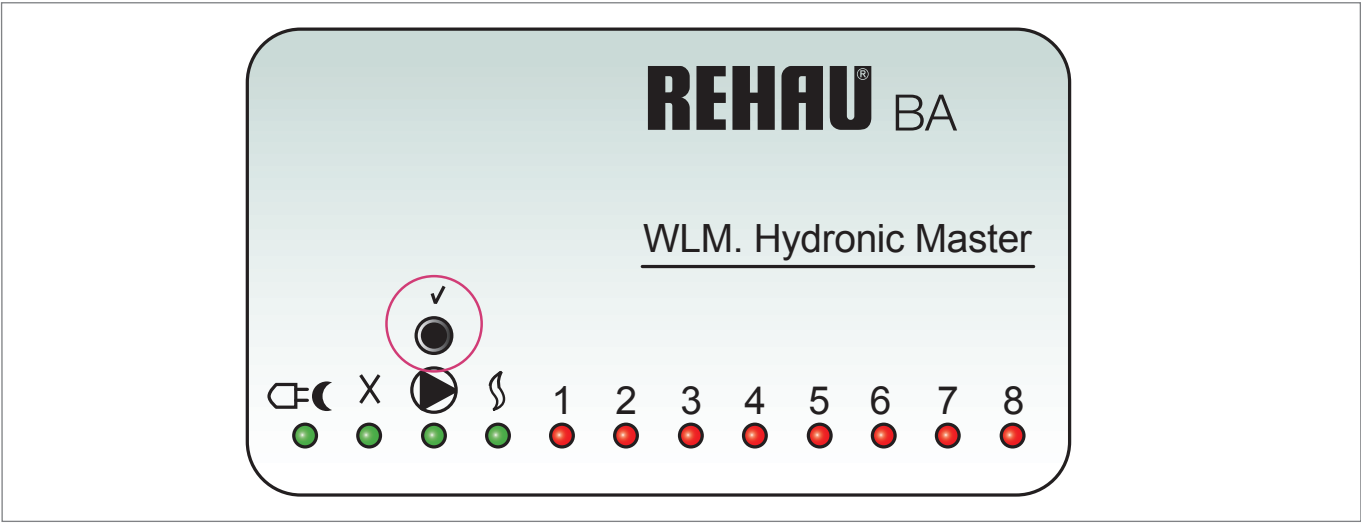
5.0 ERROR/FAULT MESSAGES AND TROUBLESHOOTING

Flashing output LED (red):

The appropriate output channel LED can flash, indicating that the Room Sensor or Controller on that channel has a fault/error. The failure code can also be seen in the service menu (submenu 2a).

| Flashes   | Description                                                                              | Corrective action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Flash   | The Master Controller has lost communication to the Room Sensor.                         | <div>The fault is corrected by re-establishing the connection to the Room Sensor and the fault condition will be automatically reset once correct communication is resumed. If the Room Sensor is defective and has to be changed, or if it has been deliberately removed, it is necessary to make a HARD RESET.</div> <div> If the Room Sensor is of the WIRELESS type, the error/fault message could be an indication that the power has failed, and that the internal battery of the Room Sensor needs to be replaced.</div> |
| 2 Flashes | The internal sensor in the CT2 Programmable Room Sensor/Controller is defective.         | The fault can only be corrected by replacing the Room Sensor/Controller. Remember to make a HARD RESET after installing the new Room Sensor/Controller.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 3 Flashes | The limit sensor on the CT2 Programmable Room Sensor/Controller is defective.            | Replace the faulty sensor. Reset is NOT required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4 Flashes | Defective REHAU CT2 Programmable Room Sensors/Controller.s                               | If a CT2 Programmable Room Controller operating a group of Room Sensors becomes defective, the remaining Room Sensors will continue control within the maximum and minimum limits programmed into the Master Controller.                                                                                                                                                                                                                                                                                                                                                                                         |
| 5 Flashes | Two or more CT2 Programmable Room Sensors/Controllers are trying to control this output. | Check "AREA" setting on the CT2 Programmable Room Sensor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

6.0 RESET



There are two different reset actions that can be used on the BA Master Controller:

| Resets                                            | To Enable                                                                                                                                                                                                                                                     | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hard Reset*<br>(used if there is a faulty sensor) | Press the " ✓ " button on the BA Master Controller for 5 seconds; a HARD RESET will be initiated (indicated by all the red output LED's (1-8) rapid lighting in sequence).                                                                                    | a) This reset will remove any Room Sensor unit with a defective input sensor, or a defective Add On Module from the system.<br>b) The fault message will be reset, but the defective items will no longer participate in the system. Once a defective unit is replaced, the new unit will automatically be recognised by the BA Master Controller and become part of the system.<br>c) This reset would erase the identity of the defective component from the Master Controller memory. |
| Factory Reset<br>(restores factory defaults)      | Press the " ✓ " button on the BA Master Controller for 15 seconds; a total factory reset will be initiated. This is indicated through flashes of channel LED's 1,3, 5 and 7 alternating with channel LED's 2, 4, 6 and 8 (while the " ✓ " button is pressed). | a) This reset will put all programmed temperature settings back to the factory defaults.<br>b) It will also remove all Room Sensors/Controllers from the master memory, and reset the system to accept only those Room Sensors/Controllers that are functioning correctly.                                                                                                                                                                                                               |

\* Hard resets do not alter the temperature settings already programmed into the BA Master Controller.

6.1 Installation information for REHAU Intelligent Controls

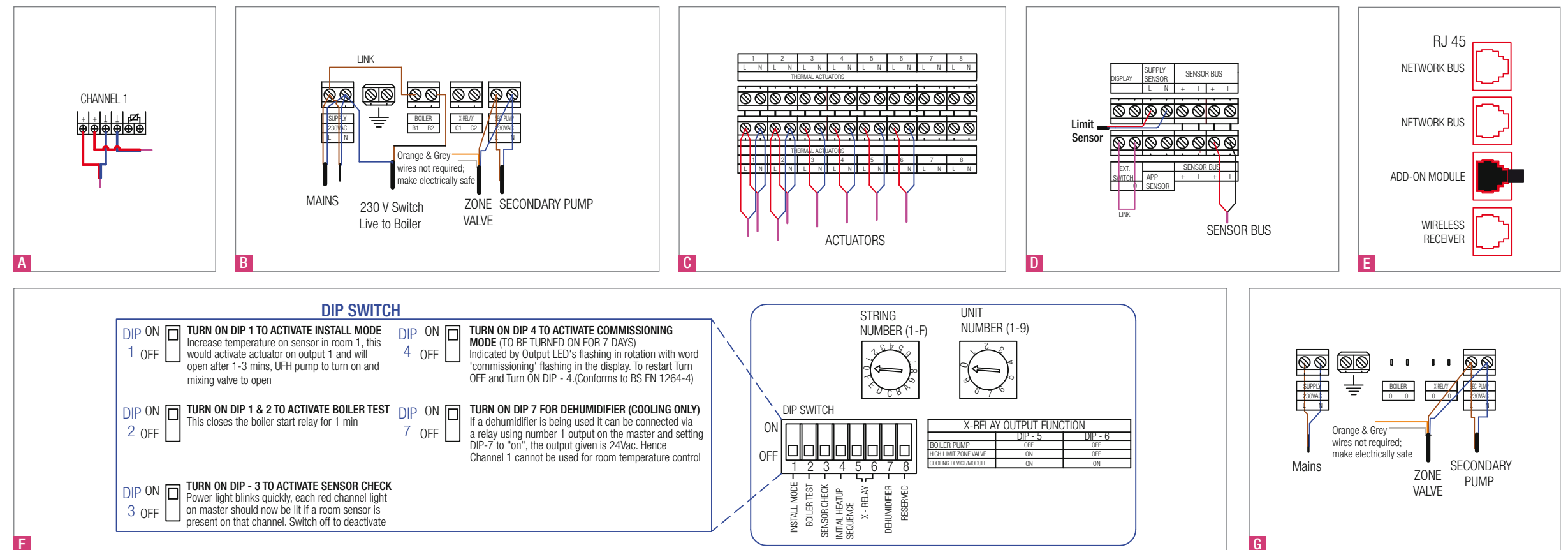
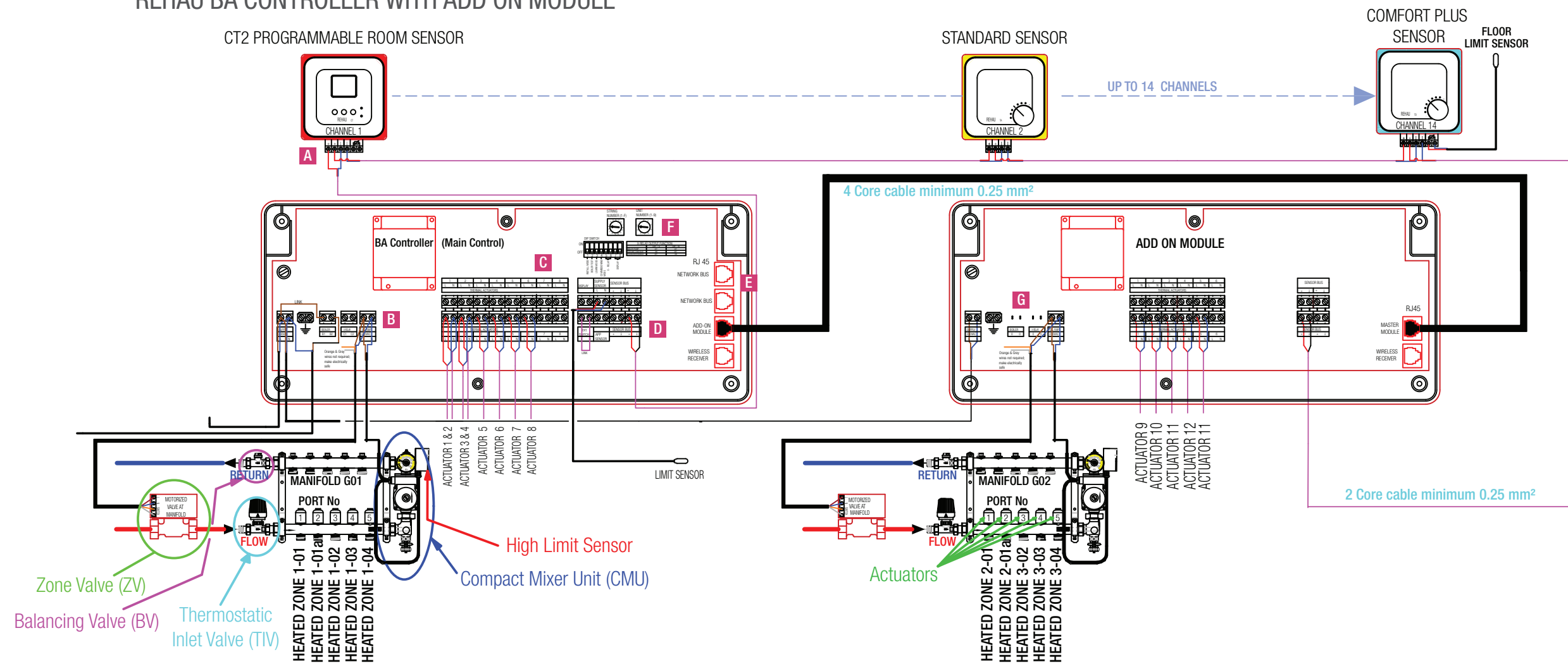
Voltage measurements

The following information should be useful to electrical installers who, with a multi meter, can measure voltages on the terminals of the Master Controller Modules and Room Sensors. Please check these measurements first, in the event of an apparent malfunction.

| Voltage measured across                                                                                                                                                   | Value                         | Description                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------------------------|
| Sensor Bus (measured at any point within the Bus)                                                                                                                         | 4.69v to 4.99v dc             | Indicates a good bus                                 |
|                                                                                                                                                                           | Less than 4.69v dc            | Indicates that one sensor may have polarity reversed |
|                                                                                                                                                                           | Above 4.99v                   | Theoretically impossible                             |
| External switch (measured across the terminals)                                                                                                                           | 11.5 to 12v dc                | Good Functionality                                   |
| Supply water sensor (measured across two terminals)                                                                                                                       | 5.0v dc                       |                                                      |
| Mixing valve actuator                                                                                                                                                     | 25v to 27v ac between + and - |                                                      |
| Drive signal (the master shows the output in the "spanner" section of the display menu, this can be checked at the actuator terminals, across the blue and black cables). | 0v to 10v dc                  |                                                      |

## 7.0 WIRING SCHEMATIC - NEXT GENERATION

### REHAU BA CONTROLLER WITH ADD ON MODULE



 The schematic shown explains the typical/basic wiring principle of the REHAU Intelligent controls. The number of Room Sensors can differ for each project.

## NOTES

- Earth wiring not shown for drawing clarity
- All wiring and earthing to be in accordance with BS 7671:2002
- Secondary pump connection must be routed back to the secondary pump terminals within the BA controller if only 1 manifold secondary pump is connected to the system. This is required to allow the pump to run should any actuator connected to the Add On Modules module be called to open.
- 4 core cable with a cross sectional area of 0.25mm<sup>2</sup> must be used to connect the Add On Modules to the BA Master Controller.
- 2 core cable with a minimum cross sectional area of 0.25mm<sup>2</sup> must be used for the thermostatic bus.
- All sensors connected to the bus must terminate at the BA Master Controller not at the Add On Modules.
- The above wiring schematic is for guidance only and should not be used as definitive wiring diagram